

Impact of The control of the port passage on its attractiveness: Case of the port of Agadir

O. Z. Ouariti¹, A. Elmenssouri², H.M. Hamri³

¹ ERETTLOG, National School of Business and Management, Université Ibn Zohr, Agadir Morocco

² ERETTLOG, National School of Business and Management, Université Ibn Zohr, Agadir Morocco

³ ERETTLOG, National School of Business and Management, Université Ibn Zohr, Agadir Morocco

Abstract – *In the context of globalization of the exchanges, the flows acceleration, the pressures increase more and more to improve the performance of the port logistics chain in the export. The link port passage is not only considered as entry and exit point but also a place including a number of public and private stakeholders; requiring a good management of the effective processes, the organization of the bilateral and multilateral relations and the preservation of the quality and the healthiness of exported products while assuring the attractiveness port.*

In this perspective, this article aims firstly to identify the criteria of choice of ports the most quoted in the literature, then the treaties with the main stakeholders and actors of the Agadir port in order to classify them according to their importance and by major process components port logistics.

Key Words: *Port attractiveness, port, shipping, port logistics.*

1. INTRODUCTION:

In an unstable and unpredictable environment, characterized by the globalization of markets and competition; the sea transport will continue to develop and its actors have to improve their competitiveness and be capable of valuing and of mobilizing all resources and skills according to needs at the end to move closer between the services offered by the actors and the requirements imposed by the applicants [1, 2].

Indeed, the logistics grafting that transverse function plays a determining role, based on three main levers: the logistic reliability, the logistic efficiency and the logistic

suppleness, for the improvement of the logistic performance of all the chain generally, and the harbour supply chain in particular [3].

This logistic performance leads to the differentiation in terms of cost, quality and deadlines; what establishes a competitive advantage to the actors and especially in a domain where the participants are multiple and the interests in several cases are divergent; such as ports [4].

Port of Agadir subdued, in the constraints of seasonality and the massifs of influxes of the perishable products in period of citrus fruits and scoops, it faces difficulties of organization and flow of flux characterized agro-exporters the peer of the irregularities, which impose in the port of counter performances at the level quality of residual and especially on export of plan of the fruits and vegetables. Of this fact; management of the main processes (stopover of the ship, chain of cold and information system) which cross chains the harbour logistics; constituent let us mesh of a sensibility significant of any chain the logistics.[5]

The link harbour passage is not only considered a point of entrance and exit, but also a place grouping a number of participants public and deprived; requiring a good management of the effective processes, the organization of the bilateral and multilateral relations and the preservation of the quality and the healthiness of exported products while assuring the adaptability of the service offered to the expected service.

The delay indicated by the various actors and the participants in the harbour supply chain and specially on the plans, the management of the information and the control of the temperature managed both at the level of transport and at the level of storing; is generally translated in terms of cost of harbour passage; by representing an important percentage of the cost price of the exported

products; and any break in the cold chain can be a source of the partial or total loss of the cargo.

So; the costs of break of the cold chain, and the lack of generalization of information systems allowing the coordination of all the operations made during the harbour passage, remain the adults constraints of the attractiveness of our ports with regard to those of the countries.

Indeed, the importance of the control of the cold chain, the coordination between the harbour operators by the integration of information systems, and the absence of orientations likely to assure an improvement of all the operations made during the stopover of the ship, establish the main reasons which incited to us to choose this work. So, we shall study possible cause of dysfunction by basing itself on our bibliographical search to raise the main criteria and the requirements studied and validated by several researchers and in various contexts, then to put them in object of treatment and evaluation with the main harbour actors.

At this level, the main question which calls out to us is the following one: to what extent the harbour actors can defend the harbour attractiveness by the adaptation of the buckle of the offer to that of the demand?

Therefore, our approach is going to articulate around the following points:

We shall be interested in the first part of our work in an exploratory research to lift the selection criteria of ports, point of view applicants, quoted by several authors and the operational aspects of the harbour passage after the brief description of the ground of study.

In the second part of this communication, we shall focus our attention on a clarification and an evaluation of the criteria lifted on the basis of questionnaires and guides of conversations beside three main things categories establishing the applicants of harbour service: exporters or their representatives, shipping companies or their maritime public harbour agencies and the developers or deprived; and in term of our search we are going to present the discussion of the obtained results, with the aim of identifying and recommending the proposed improvements (according to the vision of the actors and the investigated participants) with the aim of a better management of the harbour supply chain and Afterward the improvement of the harbour attractiveness by the search for the total satisfaction of the requirements imposed by the applicants of the harbour service.

2. THE ATTRACTIVENESS OF PORTS: INDICATORS AND PRACTICAL STAKES:

The harbour attractiveness is only the capacity to attract and to hold the activities, the companies and the populations, or still, as the capacity to hold (retain) and to develop the assets (active persons) which it already has [6]. There are classic said factors of attractiveness (natural resources, raw materials, closeness of the big networks, etc.), and other new factors emerge. The latter often result from costs, deadlines and quality of the services and of they bet in prospect towards its competitors.

In what follows we shall present the selection criteria of ports then the ground of survey which is the port of Agadir.

1.1 The selection criteria of ports:

According to the magazine of literature, we can conclude that the selection criteria of ports depend on the capacity of the latter to improve: its logistic reliability in terms of the management of harbour service offered its logistic efficiency in terms of the control of the processes and the logistic suppleness to face the various changes of the environment.

The authors, [7 , 8], show that we can classify the selection criteria of ports in three categories of the logistic performance:

- Indicators of service offered to the various customers and the productivity of the harbour zones, the services of ships and load and the unloading which is closely linked to information concerning the quantity of debit of the traffic of goods which uses an equipment or port facilities.
- Indicators of use, worth knowing the use of port facilities and equipment's of production to manage effectively all the processes passing in transit the harbour supply chain and especially the transport chains.
- The indicators of information departments, which is closely linked to the length and the generalization of the information for the suitable deadlines beside and about all the participants and the actors of the harbour supply chain to improve the flexibility and adapt itself quickly to the evolution of the possibilities.

The strategic suggestions of the harbour authorities and the selection criteria of ports presented by previous studies in the harbor domain are summarized in the table.1.

Table -1: Board 1: the criteria of choice of port

Les critères de choix des ports	Auteurs
- Level of the supplied services;	[9], [10], [11], [12], [13], [14], [15], [16],[17],[18]
- Geographical Advantage;	[19], [10], [11], [12], [20], [21], [22], [17], [23],[24],[25]
- Infrastructures and installations harbor adequate	[19], [10], [11], [12], [13],[14],[17],
- The harbor passage coast	[19],[10],[11], [12],[13], 14, [15],[16],[26] [27],[23],[28], [17],[24],[29]
- Security of the harbor zone	[19], [10], [11], [12],
- Social climate and qualification of the human resources	[19], [10], [11], [12], [17], [18]
- Control of time and Deadline of wait	[19],[10],[11], [12],[17], 18, [20],[23]
- Frequency of stopovers of ships	[12],[13],[18]
- Availability Support of the information technology and the communication	[12], [13], [16], [10],
- Strategies and the harbor planning	[12], [13]
- Specific installations and materials of exploitation	[17], [10], [18], [31], [10], [17]

- Use of the IT tool and the single window	[17], [10], [18]
- Adaptability of equipments and the flexibility of the processes.	[17], [10], [18], [32], [29]
- Simplicity of changes and crew	[20], [16],
- Institution of the techniques of automation of terminals by standards EDI.	[33], [16]
- Cooperation enters the private sector and public throughout the chain logistics of ports	[26], [16], [30]
- Accessibility in the infrastructures of the port	[26], [30]
- Efficiency of the management of the terminal; the duration of handling of load and unloading; the services of expedition and the safety of the goods	[34], [29], [10], [26]
- Availability of space of accosting of ships and storage of goods in the port	[34], [25]
- Volume of goods	[17], [35], [25]
- Interconnection between the port and the inner harbor	[32], [36], [10],
- Depth of the channel of navigation	[23], [32], [28],
- Competition interns (services of expedition and the road transport, handling, load, unloading)	[30], [10]
- Transit Time of ships in the port	[34]
- Adaptability of the service to the handled type of cargo	[16]
- Availability of the regular lines towards the main destinations	[24]

1.2 Ground of study: operational aspect of the Harbour passage

The sea transport plays a major role in the option of opening chosen by Morocco the configuration of the exchanges of which is identical to that of the island. The efficiency of the harbour supply chain consequently has to be in the heart of the concerns of functioning, organization and the harbour reform. This upgrade will come to answer in various forced; exogenous¹, endogenous² and those bound to the administration and the infrastructure. In view of all their failures, the adapted harbour reform and exactly the law 15.02, gave birth to two new entities, the ANP, the harbour authority in charge of kingly privileges of management and regulation of the activities within the ports of the Kingdom And MarsaMaroc, company in charge of commercial activities granted in the aforementioned ports instead of the ODEP so, it aimed at ambitious objectives³ to improve the competitiveness of ports.

Morocco arranges more than 3.500 km of coast along the Atlantic Ocean and along the Mediterranean, and besides its geographical location considered by the economic players favored, it spreads since its independence several actions and reforms leading to the development and to the improvement of the offer of this sector.

Today, Morocco assures, from thirteen (13) commercial ports which it has, more than 98 % of its trade with the outside by the sea transport and their value reaches 96 % of the total value of the exchanged products⁴.

Endowed with four specialized quays and counted several participants at the level of the maritime transport chain; and more exactly the link of the management of the cold chain during the harbour passage, the port of Agadir knew remarkable evolutions⁵, in terms of arrangement of

¹ Liberalization of the trade (agreements) of free trade with EU, the USA, Turkey and Arab countries and membership of Morocco to the WTO(WORLD TRADE ORGANIZATION).

² More demanding Operators on the quality of the services and on the truth of the prices, interest of the private in the management of the public service, fast technological evolutions which require systematic and real time adaptations

³ Unify the handling chain, create the environment convenient to the competition and Separate the missions of harbour authority of those purely commercial of dock work.

⁴ Report of The national harbour strategy on the horizon on 2030; Ministry for the Equipment and Transport

⁵ The port is demolished in its big part in 1960 further to a horrible earthquake, and its reconstruction lasted until the 1971, and further to an order of the Secretary of the public works, the management of the harbour public services will be assured from now on by the RAPC which had implemented a series of the works such as: the extension of quays, Construction of new additional stores, Equipment in cranes, and Acquisitions of powerful tug boats. In 1984, was create the ODEP, as

equipment and administration. It is about the first port of exports of citrus fruits and scoops, and knows a traffic of the containerization of 159.774 EVP in 2014, or a 11,9 % increase in year 2014 by contribution in the year 2013, what represents more than 6 % of the national traffic⁶, and counted several participants at the level of the maritime transport chain and more exactly the harbour supply chain.

In spite of the efforts supplied, The port of Agadir is exploited only in 61 % of its operational capacity (4,3 million tons / year) and in only 43 % of its theoretical capacity⁷ (6 million tons / year)⁸.

2. PRESENTATION OF THE RESULTS OF THE STUDY:

2.1- Approach and methodology:

With the aim of answering the questions relative to our problem, we proceeded to the realization of this study, by following the positioning characterized by a deductive reasoning.

We opted for a qualitative approach, because we considered that through the interpretation of the speeches of the actors, it is possible to understand and to explain the factors of improvement of the competitiveness of ports, in a complex supply chain, and to define the processes to optimize in the harbour supply chain and especially that bound to the transport containerized by the sector " fruits and vegetables ".

Then, we went deeper into the results of the conversations managed by a quantitative approach. This approach allowed us to verify, and to validate the data of search predefined by the analysis and the interpretation of the meditative data, via guides of conversations realized with the harbour authorities. We established two questionnaires (the first one intended for chargers and the second to the shipowners), distributed and filled by the

substitutes for the RAPC, for the management of ports. The port of Agadir is managed from now on by the DEPA, which will take care of services provided on the port and the administration of the material, human resources and financiers so as to improve services provided and satisfy the clientele.

⁶ Report of the Statistics harbour activity, ANP on 2014

⁷ The theoretical capacity of a harbour terminal is the potential which offer the existing infrastructures in terms of volume of traffic, by considering that the organization and the mode of exploitation of this terminal are optimal

⁸ Report of the national harbour strategy on the horizon 2030 Ministry for the Equipment and Transport 2011

representative sample of the actors and the participants, deprived and public, in the operations of the harbour passage (20 exporters fruits and vegetables, 10 forwarders, 5 shipowners, 1 consignees, and 1 agents).

The guides of managed interview and the questionnaires include at the same time closed questions, open questions, multiple-choice questions, and consist three main columns:

- Importance of the harbour passage grafting that link of the harbour supply chain in the export;
- Evaluation of the harbour supply chain in the export;
- Evaluation of the selection criteria of ports.

These tools established the base of meetings deepened with the persons in charge of the actors involved in the investigation. It allowed us to identify:

- The key processes of the competitiveness of ports (management of stopover of ship, control of the cold chain and the generalization of the information system),
- The criteria of attractiveness of ports;
- The propose improvements.

2.2- Discussion of the results:

The questioned sample allows us to attract reports and serious conclusions not only to the port of Agadir, but also to three big Moroccan commercial ports; because all of the maritime agencies questioned appear in these three ports; 80 % of the exporters fruits and vegetables makes loadings via these ports, and 75 % of the harbour persons receiving benefits (forwarders and agents) investigated are represented in the other regions or they even represent parent companies. What also allowed us to have a clear vision on the national harbor functioning.

The investigated chargers occurring in the harbour supply chain in the export of fruits and vegetables are mainly interested in the service of the transport Reefer, 85 % of their traffics are exported via the port of Agadir, while the 15 % divide up between the port of Casablanca and the port of Tangier. This state justifies itself by the search for direct lines to optimize the deadlines (extensions) of transit.

The investigated declare that the optimization of the deadlines of transit in the port of Agadir, requires the control of the harbour logistics, the interconnection between the various existing information systems, and the clear formulation of procedures allowing the management of the relations between the various participants and the

harbour actors. Only the procedures bound to the regulations in force which are applied until this day to the port of Agadir.

Questionnaires, guides of conversations and the direct meetings; also allowed us, to end in the following results:

- 100 % of the investigated confirmed that the management of stopover of ship, the control of the cold chain, and the generalization of information system are the main processes of it of the harbour supply chain and which allow the improvement of the attractiveness of ports.
- Three indicators of logistic performance quoted in the magazine of the literature; indicators of service offered to the various customers, the indicators of use, and the indicators of information departments; correspond successively to the main processes of the harbour supply chain: the management of stopover of ship, the control of the cold chain, and the generalization of information system;
- The importance of the use of the technologies of communication by the shipowners to exceed any delay in the date of sequence. This delay establishes the reason of the compensations paid by 60 % of chargers.
- 90 % of the investigated underwent the payment of demurrages considered inequitable, especially at the level of the duration of the franchise (electric connection of containers), which does not exceed 5 days (7 days in the port of Casablanca) among which the holidays;
- The transit time is a critic: indeed if a ship is stranded delayed, it implies additional costs of transport, which consequently increases the cost of the passage harbour and weakened the attractiveness of the port. 67 % of chargers supportedre-taxations caused by the defects of forecasts of the shipowners;
- The ambiguity of the invoicing of the services offered by MarsaMaroc especially that of the storage, sometimes includes the use of equipments non-existent in the port of Agadir; while the operator MarsaMaroc justifies that the amount to be paid is tacitly charged by the centralized system;
- 90 % of the investigated harbour customers demand the big disparity in the exchanges between actors, as well in the contents of the data as at the level of information media and the lack of interconnection between the various existing systems what

influences negatively the deadlines of transit and the cost of passage;

- The operators of the sector of fruits and investigated vegetables, demand inadequacies in refrigerated equipment's and of specialized handling (slowness in the harbor operations in spite of all the efforts spread to improve their capacity), the not control of the supply chain of the cold, and the lack of coordination enters participants significant number the chain(channel);

The result of the evaluation of 20 selection criteria of ports; classified according to their importances for the improvement of the harbor competitiveness according to the vision of the investigated; appear at the following table:

Table -2: 20 criteria the most frequented with the degree very important

	The Port Selection criteria	Effectif	%
A	Geographical Advantage	37	100
B	Infrastructures and installations harbor adequate	37	100
C	Security of the harbour zone;	37	100
D	Transit Time of ships in the port,	37	100
E	Control of time and Deadline of wait	37	100
F	Availability Support of the information technology and the communication	37	100
J	Frequency of stopovers of ships	37	100
H	The harbour passage coast	37	100
I	Specific installations and materials of exploitation	37	100
G	Level of the supplied services	37	100
K	Availability of the regular lines towards the main destinations	37	100
L	Use of the IT tool and the single window	37	100
M	Adaptability of equipments and the flexibility of the processes.	37	100
N	Institution of the techniques of automation of terminals by standards EDI.	37	100
P	Social climate and qualification of the human resources	37	100
Q	Efficiency of the management of the terminal; the duration of handling of load and unloading; the services of expedition and the safety of the goods	37	100
R	Interconnection between the port and the inner harbour	36	97,30

S	Cooperation enters the private sector and public throughout the supply chain of port	35	94,59
T	Competition interns (services of expedition and the road transport, handling, load, unloading)	35	94,59
V	Adaptability of the service to the handled type of cargo	35	94,59

- The classification of the criteria of choice of ports; considered very important by the various customers of the port; according to three main processes of the harbour supply chain validated empirically, appear as follows

Table -2: the busiest 5 criteria according to the main processes of the harbor supply chain

The management of stopover of the ship			The control of the cold chain requires			The generalization of information system		
criteria	Effectif	%	criteria	Effectif	%	criteria	Effectif	%
A	37	100	I	35	94,59	N	37	100
Q	37	100	M	35	94,59	F	35	94,59
C	35	94,59	K	33	89,19	L	34	91,89
T	32	86,47	V	33	89,19	R	34	91,89
B	32	86,47	G	33	89,19	S	30	81,08

3. CONCLUSIONS

We reviewed the components of a harbor logistic system, which was followed of a set of criteria of competitiveness of port. Besides factors discussed in the magazine of literature, guide's results of interview and questionnaires made confirm that three axes (management of stopover of the ship, the control of the cold chain, the generalization of IF), the key links of the harbour supply chain establish and to validate their importance for the harbour attractiveness.

So, the empirical work allowed us to encircle for every axis five important bound criteria:

- The management of stopover of the ship, its competitiveness is affected by: the geographical advantage, the efficiency of the management of terminal, the safety of harbour zone, competes with

it internal and Infrastructures and installations harbour adequate;

- The control of the cold chain requires: specific Installations and materials of exploitation, Adaptability of equipment's and the flexibility of the processes, Availability of the regular lines towards the main destinations, Adaptability of the service to the type of cargo treaty and level of the supplied services;
- Finally, the generalization of information system makes the harbour passage more competitive by the institution of the techniques of automation of terminals by standards EDI, Availability Support of the information technology and the communication, Use of the IT tool and the single window, Interconnection between the port and the inner harbour and Cooperation enters the private sector and public throughout the harbour supply chain.

Three processes aforementioned, are considered very important by the various customers of the port, and consequently having a very significant impact on the attractiveness of the port of Agadir.

Furthermore, the interviews allowed us to detect two other criteria not city in the magazine of literature, in particular:

- The crisis management because the harbour sector is always submitted to important hazards (uncertain demands), disasters natural or caused by the man) which threaten its organization and degrade its competitiveness;
- The credibility of the harbour operators which can favor or disadvantage the logistic competitiveness of ports.

REFERENCES

- [1] F. T. Bresnahan, B. Erik and M. H. Lorin, "Information Technology, Workplace Organization and the Demand for Skilled Lanor: Firm-Level Evidence", *Quarterly Journal of Economics*, Vol 117, n 1, pp.339-376, 2002.
- [2] S. Benhamou, "Coordination process, organizational choice and environment complexity", Mimeo. 2003.
- [3] T. JOUENNE, "Les quatre leviers de la logistique" durable, *Revue Française de Gestion Industrielle*, Vol. 29, n°1, Paris, 2010
- [4] O.O. Zerouali and A. Elmenssouri, "The impact of the optimization of stopover management on the port attractiveness; Case of The port of Agadir". *Journal Automation & Systems Engineering* 7-1. 1-6, 2013.
- [5] A. Elmenssouri, O.O. Zerouali and H.M. Hamri, "the chain of cold; lever of the competitiveness of the ports or simple link of the supply chain? Case of the port of Agadir", *IJISSET*, Vol 1, Issue 9, 2014.
- [6] M. Hostert and J.P. Lemaire , "Analyse dynamique de l'attractivité et du développement international d'une Petite Economie Mature Ouverte (PEMO) : le cas du Luxembourg", volume 2 Page 11-14, 2014.
- [7] K, Bichou. "Review of port performance approaches and a supply chain framework to port performance benchmarking. Devolution, Port Governance and Port Performance Research in Transportation Economics, 17, 567-598, 2007.
- [8] C. S. LU, C.C. LIN and M.H. LEE, "An Evaluation of Container Development Strategies in the Port of Taichung", the *Asian Journal of Shipping and Logistics*, Vol 26. 1 pp. 093-118, 2010.
- [9] Wayne K.Talley, M. WoNg, "Maritime transport chain choice by carriers, ports and shippers"; *Int. J. Production Economics* ; 142; 311-316, 2013.
- [10] C. A. Yuen, A. Zhang and W. Cheung, "Port competitiveness from the users' perspective: An analysis of major container ports in China and its neighboring countries", *Research in Transportation Economics* 35 ; 34- 40, 2012.
- [11] J.Tongzon, Y.T. Chang and S.Y. Lee, "How supply chain oriented is the port sector?", *Research in Transportation Economics* 122 ; 21-34, 2009.
- [12] Rapport UNCTAD, "Strategic Planning for Port Authorities" United Nations, 1992
- [13] J.Tongzon, and S. Ganesalingam, "Evaluation of ASEAN port performance and Efficiency". *Asian*, 1994.
- [14] H. Sutomoa, and J. Soemardjito, "Assessment Model of the Port Effectiveness and Efficiency: Case Study: Western Indonesia Region", *Procedia - Social and Behavioral Sciences* 43; 24-32, 2012.
- [15] W. V. Albert, H. M. Mulder and R. A. Sels, "Analysing container flows in the Caribbean", *Journal of Transport Geography*, 13, 295-305, 2005.
- [16] P. Murphy, J. Daley and D. Dalenberg, "Port selection criteria: an application of a transportation research framework", *Logistics and Transportation Review* vol. 28, no.3, pp. 237 255, 1992.
- [17] D. W. Song, and K. T. Yeo, "A competitive analysis of chinese container port using the analytic hierarchy process", *Maritime Economics and Logistics*, 6,34 -52, 2004
- [18] C. Ugboma , O. Ugboma, I. Ogwude, "An analytic hierarchy process (AHP) approach to port selection decisions —empirical evidence from Nigerian ports", *Maritime Economics and Logistics* 8, 251-266, 2006.

- [19] B. Matthew et al., "A disaggregate analysis of port selection", *Transportation Research Part E* 40, 317–337, 2004.
- [20] M. Acosta, D. Coronado, D. M. Cerban, "Bunkering competition and competitiveness at the ports of the Gibraltar Strait", *Journal of Transport Geography*, 19, pp. 911–916, 2011.
- [21] P. I. Tiwari and H. M. Doi, "Shippers' containerized cargo transportation behaviour in China: a discrete choice analysis." *Journal of Transportation Economics and Statistics*, 6, 1: 71–87, (2003).
- [22] P. Murphy, J. Daley and D. Dalenberg, "Selecting links and nodes in international transportation: an intermediary's perspective". *Transportation Journal*, 31, 2: 33–40, 1991.
- [23] H. Tai, C. Hwang, "Analysis of hub port choice for container trunk lines in East Asia". *Journal of the Eastern Asia Society for Transportation Studies* 6, 907–919, 2005.
- [24] T. Lirn, H. Thanopoulou and M. Beynon, "An application of AHP on transshipment port selection: a global perspective", *Maritime Economics and Logistics* 6, 70–91, 2004.
- [25] Y. T. Chang, S. Y. Lee, and J. L. Tongzon, "Port selection factors by shipping lines: different perspectives between trunk liners and feeder service providers". *Marine Policy* 32, 877–885. *Economic Journal*, 8, 3: 317–330, 2008.
- [26] G. D'Este, and S. Meyrick, "Carrier Selection in roro Ferry Trade: Part 1; Decision Factors and Attitudes". *Maritime Policy and Management*, vol.19, no. 2, p115, 1992.
- [27] M. Brooks, "An alternative theoretical approach to the evaluation of liner shipping 'Part 2: choice criteria", *Maritime Policy and Management*, vol.12, no.2, pp.145–155, 1990.
- [28] J. Tongzon, "Determinants of competitiveness in logistics: implications for the ASEAN. Region", *Maritime Economics and Logistics* 9, 67–83, 2007.
- [29] J.L.Tongzon and L. Sawant, "Port choice in a competitive environment: from the shipping lines' perspective" *Applied Economics* 39, 477–492, 2007.
- [30] M. Acosta, M. Cerbán, and D. Coronado, "Port competitiveness in container traffic from an internal point of view: the experience of the Port of Algeciras Bay", *Maritime Policy and Management* 34, 499–518, 2007.
- [31] M. Brooks, "Measuring Port Devolution Program Performance: A Managerial Perspective", *Transportation Economics*, Vol.17, no.25, pp.599–629, 2006.
- [32] J. L. Tongzon, and W. Heng, "Port privatization, efficiency and competitiveness: some empirical evidence from container ports (terminals)", *Transportation Research Part A*, 39, 405–424, 2005.
- [33] Rapport ICHCA news letter, "Container safety and Terminal lighting", 2012.
- [34] K. Bichou, and R. Gray, "A logistics and supply chain management approach to port performance measurement", *Maritime Policy & Management*, vol. 31, no. 1, pp. 47–67, 2004.
- [35] A.B. Steven, T.M. Corsi, "Choosing a port: an analysis of containerized imports into the US". *Transportation Research Part E* 48, 881–895, 2012.
- [36] B. W. Wiegmans, A.V.D Hoest, and T.E. Notteboom, "Port and terminal selection by deep-sea container operators", *Maritime Policy and Management* 35, 517–534, 2008.

BIOGRAPHIES

Ouafae ZEROUALI OUARITI is a Professor of Higher Education and responsible of the Equipe de Recherche en Economie du Transport, Technologie de l'Information et Logistique (ERETTLOG). National School of Business and Management Agadir Morocco.

Abdellatif ELMENSSOURI is a PhD student in Supply Chain Management and a member of the Equipe de Recherche en Economie du Transport, Technologie de l'Information et Logistique (ERETTLOG), Ecole Nationale de Commerce et de Gestion of Agadir, Morocco.

Hicham MOHAMED HAMRI is a Professor of Higher Education and a member of the Equipe de Recherche en Economie du Transport, Technologie de l'Information et Logistique (ERETTLOG). National School of Business and Management Agadir Morocco.